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ABSTRACT

This paper consolidates findings from two related studies: William Brown's research on the predictive ability of measures of early and non-high school interracial contact/opportunities that appear to affect interracial attitudes and behaviors in high school; and Martin Patchen's investigation in Indianapolis, Indiana high schools analyzing the interrelationships among variables that are thought to influence high school interracial attitudes and behaviors. Brown's study identified the following variables to be significant predictors of interracial attitudes and behaviors in high school: family attitudes toward other races; the combined effect of the amount and nature of contact with other races; physical proximity to other races in school settings; age when children became well acquainted with other races; sex; parents' education; and pre-high school opinions of other races. Patchen's analysis indicated that racial relations among high school students were significantly predicted by parents' racial attitudes, early cross-racial contact, the degree of students' aggressiveness, and participation in school activities. In both studies, opportunities for contact figured as a weaker measure of future cross-racial relationships than the amount and nature of actual contact. It was suggested that further studies consider such measures of contact as classroom racial composition; students' physical proximity in classes or other school groups; and age of initial interracial contact. (Author/MJL)

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ASSESSING MEASURES OF CONTACT THEORY

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ASSESSING MEASURES OF CONTACT THEORY

Overview of the Status of Contact Theory Research

Most research on racial desegregation has accepted Allport's three basic prmises that "Prejudice (unless deeply rooted in the character structure of the individual) may be reduced by equal-status contact between majority and minority groups in pursuit of common goals. The effect is greatly enhanced if this contact is sanctioned by institutional supports (i.e., by law, custom, or local atmosphere), and if it is of the sort that leads to the perception of common interests and common humanity between members of the two groups" (Allport, 1958:257).

Cook (1970), as well as other writers, has supplemented Allport's three basic aspects of interracial contact by discussing the importance of:

1. The numerical proportions of the two groups
2. The degree to which minority group members have attributes which correspond to the negative stereotypes of the majority
3. The possession of valued traits by members of each group
4. Similarity in beliefs between the members of the two groups
5. The acquaintance potential of the situation
6. Physical proximity

However, as Schofield has pointed out, "Researchers often tip their hats to contact theory in the introductory passages of research reports and then fail entirely to give information on topics which the theory suggests should be vital to predicting the likely outcomes of interracial experiences" (Schofield, 1978:335). Schofield also noted that much conceptual and empirical work remains to be done in determining which variables, or combination of variables, are instrumental in bringing about changes in interracial attitudes and behaviors.

To sum up, there have been relatively meager efforts to systematically test the variables that have been suggested as having a primary impact on outcomes from interracial contact.

The Purpose of this Paper

Recently Martin Patchen has completed an exhaustive, systematic analysis of the interrelationships among a multitude of variables that can affect interracial attitudes and behaviors in high schools. (Black-White Contact in Schools: Its Social and Academic Effects. Purdue University Press, 1982). This touches on some findings from an in-depth study of eleven Indianapolis High Schools in which he and James D. Davidson were co-principal investigators. The major thrust addressed here concerns measures of types of interracial contacts or contact opportunities and their relative

importance as predictors of subsequent racial attitudes and behaviors. Gerhard Hoffman and William R. Brown, then graduate students, collaborated with Patchen and Davidson in this major study. Parts of this report draw upon Brown's dissertation which examines the strengths of measures of early, non-high school race related factors that appear to have affected interracial attitudes and behaviors in high schools.

More specifically, the major focus of this paper is on the following measures of interracial contact and their relative ability to predict racial attitudes and behaviors in high schools such as perceptions of "goodness" of the other race, avoidance behavior, and friendly interaction:

1. The opportunity for interracial interaction in schools as well as the classrooms within the schools
2. The physical proximity of blacks and whites in school settings
3. The length of the grade school contact opportunity
4. The separate and combined effects of the amount and the nature of actual interracial contact
5. Age of initial contact with other race youth
6. Number of other race high school friends that were known in grade school

As a further means of viewing the relative importance of the above types of measures of crossracial contact, we will present a very limited discussion of how these contact measures fare when they "compete" (using Multiple Regression analyses) with numerous other variables that affect various social outcomes in the high schools.

Lastly, the paper includes a brief discussion of the implications of using various measures of contact followed by a discussion of the need for researchers to develop conceptual models that further integrate the variables into ongoing, cybernetic models.

We cannot provide much detail in this brief paper regarding the complexities inherent in this major study. Nonetheless some important points can be drawn from those parts of the study related herein. The interested reader can refer to the series of articles by Patchen and his colleagues and also to his new comprehensive book.

The Study of Indianapolis High Schools*

School racial compositions permitting about sixty students of each race in each of the eleven public high schools were selected via systematic random sampling procedures. The sample was stratified according to grade level

*The Study was sponsored by the Office of Education, Grant #OEG 5-70-0041 (508): Project #00561. Actually there were 12 schools, but one was an integrated freshman class housed away from the "parent" all black high school.

(freshman through senior) by selecting every nth student from alphabetical list of students in each class. The sampling fraction varied by total enrollment of each race in each class level with each high school for the year 1971.

These sampling procedures yielded a total sample of 5479 students, 2645 black and 2834 white. Of these about 82% of the blacks and 85% of the whites completed Part I and/or Part II of the comprehensive questionnaires. The sample was comprised of almost equal proportions of male and female students.

The two-part questionnaire was pretested; some modifications were implemented. Separate black questionnaires and white questionnaires were printed so the use of "Other Race" could be avoided and the specific race (black or white) could be mentioned as needed. The question items were constructed so that a series of indices could be formulated to measure the major dependent variables (e.g., avoidance behavior, friendly behavior, unfriendly contacts, and various additional perceptions of student attributes). Included were questions regarding the students' opportunity for contact in various situations, the actual amount of contact and its nature, students' backgrounds, and their personal characteristics. School situational factors including detailed information from 800 teachers and school administrators were also collected along with school data on magnetic tapes that provided the students' grades, class schedules, achievement scores, I.Q. scores, attendance records, etc.

Although this rich body of data was collected about ten years ago, the information continues to yield valuable insight into the conceptual processes and conditions under which the many influences interact. Seldom has school data been subjected to such thorough analysis, including provisions and adjustments for conditions of non-linearity, and statistical interaction. Other data management procedures were systematically applied to improve the accuracy of the information.

A more detailed account of the methodologics employed, the question items, and the construction of the many indices can be viewed in Patchen (1982) and Brown (1974).

Findings

First, some findings are presented from Brown's (1974) study of the relative ability of different types of measures of interracial contact and contact opportunities to predict several social outcomes. Included among the early and non-high school predictor variables are measures of the students' parents' attitudes towards other race people and also the educational level of the parents. The dependent variables in this analysis are:

1. Pre-High School Opinions of Other Race People: Question: In general, what was your opinion of most black (or white if the respondents were black) people just before you came to this school? Four response categories range from "Good" to "Not good at all."

TABLE 1. SUMMARY OF VARIABLES WHICH MAKE SIGNIFICANT CONTRIBUTIONS TO PREDICTING INTER-RACIAL PRECEPTIONS AND BEHAVIORS ACCORDING TO RACE[a] (Partial Beta Coefficients)

Predictor Variables	Pre-H.S. Opinions		Perceptions of "Goodness"		Avoidance Behavior		Friendly Interactions	
	Black	White	Black	White	Black	White	Black	White
Age when first got to know other race youth	-.14**	-.15**					-.11**	(-.13**)
No. of black H.S. friends known in grade school	-.10*		-.11**					.13**
No. of white H.S. friends known in grade school	.17***	-.12**					.14**	
Sex (high score is female)		.12**		.09*	-.08*	-.18***	-.12**	
Total opportunity for contact with O.R. students in G.S. classes			-.10*		.12*			
Amount-times-nature of contact in grade school	.19***	.24***	.12**	.11*	-.13**			(.11*)
Amount-times-nature of contact in neighborhood before high school	.09*	.16***	(.13**)	(.09*)		(-.12*)	(.19***)	(.24***)
Segregation of neighborhood							(-.09*)	-.10*
Amount-times-nature of contact in neighb. before and during H.S.				.14**		-.13**	.15***	.25***
Amount-times-nature of contact in miscellaneous environments			.15***	.15***		-.11*	.30***	.28***
Positive family attitudes toward other race people	(.27***)	(.30***)	.27***	.27***	-.29***	-.23***	(.14**)	
Education of parents		(.09*)						.13***
Opinions of other race people prior to high school			.18***	.18***	-.12**	-.15**	(.12**)	

[a]The partial Beta coefficients that are shown in parentheses are findings from the separate analyses of plausible "early" predictor variables that contributed significantly to the above dependent variables. The partial Betas indicate the relative strength of the independent variables on the various dependent variables after the effects of the other independent variables are controlled out. Pearson correlation ceofficients were generally several "points" (.05-.15) higher than the partial betas

Table 2. Summary of Significant Predictors of Interracial Behaviors and Attitudes among Black Students (Partial Beta Coefficients)[1]

	Avoidance	Friendly Contact	Friendship	Unfriendly Contact	Positive Attitude	Positive Opinion Change
A. Background						
No early friendly contact with whites: high school classes < 40% black	.13***					
Much friendly contact with whites in grade school		.12*				
Amount of friendly neighborhood contact with whites prior to high school					.08*	
Much friendly contact with whites in neighborhood prior to high school		.15***				
Positive family racial attitudes	-.25***	.16***	.24***	-.14***	.29***	.25***
B. Student Characteristics						
Aggressiveness	.24***	.09**		.32***	-.13***	
Sex female				-.12**		
Educational aspirations			.08*			
IQ					.11**	
General life satisfaction		.08*			.19***	.18***
High effort			.11**			
C. Opportunity for Interracial Contact in High School						
Classes 40% black no early friendly contact with whites (see A also)	.13***					
Classes 80% black or more		-.09*				

	Avoidance	Friendly Contact	Friendship	Unfriendly Contact	Positive Attitude	Positive Opinion Change
Classes 40-90% black						.17***
Participation in activities		.27***	.14***			
D. High School Situation						
Ethnocentrism of same-race peers	.09*				-.12***	
Participation in interracial subgroups in classes	-.07	.10**	.10**			
Grades, relative to white school mates				-.08*		
Power of blacks perceived much greater	.07			-.08*	-.07*	
Power of blacks perceived a little greater	.10*		-.12**			
Power of whites perceived a little greater					-.08*	
Power of whites perceived much greater					-.08*	
Perception of school trying to solve problems	-.09*				.11**	.10*
Perception of favoritism toward whites			-.14*		-.24***	-.14*
Perception of school strictness					-.12***	
Proportion of variance explained (R^2)	.25	.24	.18	.21	.39	.15

1. Results from multiple regression analyses with pairwise treatment of missing data. Ns for correlations on which analyses were based averaged about 1,500. Other variables included in the regression analysis, which did not have significant effects, were: church activity; height; SES, relative to white schoolmates; ethnocentrism of other-race schoolmates; opportunity for contact with black faculty; perceived favoritism by staff toward own race; perceived attitudes of same-race teachers concerning interracial contact.

Table 3. Summary of Significant Predictors of Interracial Behaviors and Attitudes among White Students (Partial Beta Coefficients)[1]

	Avoidance	Friendly Contact	Friendship	Unfriendly Contact	Positive Attitude	Positiv Opinion Change
A. Student Background						
Unfriendly neighborhood contact with blacks prior to high school	.09**			.15***		
Some friendly neighborhood contact with blacks prior to high school			.09**			
Much friendly neighborhood contact with blacks prior to high school		.29***	.15***	.09**	.09**	
Amount of friendly contact with blacks in grade school		.09**	.11**		.11***	
Positive family racial attitudes	-.24***	.10***	.15***	-.08*	.33***	.14***
B. Student Characteristics						
Male, aggressive, and short	.15***					
Male, aggressive, and tall	.17***					
Male and unaggressive	.11**					
Female				-.13**	.14***	.07*
Aggressiveness		.11***	.07*	.37***		
IQ						-.09*
General life satisfaction					.11***	
C. Opportunity for Interracial Contact in High School						
Classes 30-50% black	.08*					

	Avoid-ance	Friendly Contact	Friend-ship	Un-friendly Contact	Positive Attitude	Positive Opinion Change
Classes 20-60% black and same-race peers high in ethnocentrism		.09*				
Classes > 40% black & same-race peers low in ethnocentrism		.21***				
Participation in activities		.22***	.11*			
High School Situation						
Ethnocentrism of same-race peers	.15***			.09*	-.25***	-.15***
Ethnocentrism of same-race peers high & much partic.in inter-racial class sub-groups			.07*			
Ethnocentrism of other-race peers					.09**	
SES,relative to black schoolmates					-.08**	-.08*
Perception of positive teacher racial attitudes	-.11***			-.08*	.07*	
Power of whites perceived much greater					-.09***	
Power of whites perceived a little greater	.12***		-.07*	.08*	-.10**	
Power of blacks perceived a little greater			-.08*		-.18***	-.12***
Power of blacks perceived much greater	.23***	-.08*	-.10**	.12**	-.26***	-.19***
Perception of problem solving in school					.12***	.11***
Proportion of variance explained (R^2)	.25	.32	.21	.31	.39	.15

Results from multiple regression analyses,with pairwise treatment of missing data. Ns for correlations on which analyses were based averaged about 1,600. Other variables included in the regression analyses,which did not have significant effects,were: religious activity;height;school effort;educational aspriations;opportunity for contact with black faculty;grades,relative to black schoolmates;perception of school strictness;perception of favoritism by staff toward own race.

2. Perceptions of Goodness of Other Race: Index comprised of 14 question items such as: ....are fun to be with; are willing to help other race students; are often mean to other race students; etc. Six response categories range from "None" to "All" or Almost All."

3. Avoidance of Other Race Students: Index comprised of seven question items such as: "Avoided sitting near some other race students; Avoided talking to some other race students; Suggested or agreed with others that only some race kids be invited to something;" etc. Six response categories ranging from "Never this semester" to "More than ten times this semester."

4. Friendly Interactions with Other Race: Index comprised of ten question items such as: "Greeted to (saying hello) when you passed by; Talked to you in a friendly way about things; other than school work (weighted double); Did things together with you outside of school (weighted 16 times); Visited your home or had you over to their home (weighted 16 times); and six other questions. Six response categories ranging from "Never" to "More than 20 times this semester."

Table 1 summarizes (from other more detailed analyses) the variables that were significant predictors of the four dependent variables partially described above. The partial beta coefficients shown in the cells of the table reflect the strength of the direct effect each significant predictor has on the various dependent variables.* (Table 1 is from Brown, 1974: 263).

Several observations are of interest from the data in Table 1.

1. First, the various predictor variables have significant direct effects on some social outcomes but not on others. That is, different "types" of contacts may have important different outcomes. This is one of many hints that contact theory involves a far more complex set of interracial factors than Allport and others envisioned.

2. Further, the effect of some predictor variables are related to one race but not the other.

3. The strongest and most consistent predictor overall was the family's attitudes toward other race people.

4. The Amount-times-nature of other race contact was rather consistently related to each of the dependent variables. This was true for the Amount-times-nature index for contact in the grade schools, students' neighborhoods, or other settings.

In this report a single "" indicates the relationship is significant at p=.05 or less; "**" indicates the relationship is significant at p=.01 or less; and "***" means that the relationship is significant at p=.001 or less. Non-significant relationships are not shown. See Kerlinger and Pedhazur (1973) for a discussion of Multiple Regression.

5. The opportunity for contact in grade school was not a significant predictor except for blacks' negative perceptions of the "goodness" of whites and the tendency for blacks to avoid white students. Only in these two instances did the measure of opportunity have an apparent effect. More opportunity for contact with white students, as indicated by having more white students in the classes of the grade school (s) attended, suggests that when a greater proportion of white students are present, black students tend to perceive them with less favor and tend to avoid them. The opposite is true when the actual contact takes place under friendly conditions.

6. Opportunity for contact as indicated by the extent the students' neighborhoods were segregated is a significant predictor only in the case of friendly interactions in high school. Students of either race who have less contact opportunity in neighborhoods are less likely to have friendly crossracial interactions in high school.

7. As Damico et al. (1981) point out, students must be in the same physical proximity (neighborhoods, grade schools, or elsewhere) in order to interact and discover their commonalities. Friendly interactions are often mediated by earlier friendship bonds. This relationship is indicated for both blacks and whites in Table 1. Students with more other race friends that they had known in grade school were likely to have more friendly interactions in high school.

8. "The younger students were when they first got to know other race kids pretty well" was significantly related to having better opinions of other race people just prior to high school and also more friendly crossracial relationships in high school. This finding supports advocates who would concentrate on bringing blacks and whites into contact early in their schooling rather than later (e.g. high school age).

9. White females tended to have more favorable pre-high school opinions of blacks, more positive perceptions of blacks in high school, and have less of a tendency to avoid blacks compared to males. Black females compared to males showed less tendency to avoid whites but they also had less friendly interactions with whites in high school.

10. White students whose parents had higher levels of education tended to have more positive pre-high school opinions of black people and also more friendly interactions in high school. NO such relationships were found for black students.

11. Finally, pre-high school opinions of the other race tended to carry over into various social outcomes in their high school relationships.

Implications of Using Various Measures of Contact

Most school studies involving the contact hypothesis have bases their findings on some measure of opportunity for crossracial contact rather than on actual contact, or, importantly, the amount and nature of contact. (Brown,1974: 274-277).

According to his analysis, opportunity for contact is not nearly so good a measure for predicting subsequent race relations as the amount and nature of contact. Both the amount and nature are needed. Brown's analysis indicated that the "amount" of contact was related to the strength of the subsequent relationship whereas the nature of the contact was the best predictor of the direction (positive or negative)of subsequent relationships.

If a researcher cannot obtain measures of actual contact, the next best measure is opportunity of contact in the classrooms via class racial composition as opposed to measures of student social composition in an entire school. Patchen's (1982:141) analysis supports this premise.

Patchen (1982:148-151) also found that in general measures of proximity are consistant with measures of classracial composition. For blacks, proximity was a better measure of social outcomes than classroom composition, especially with respect to friendly interactions. Apparently being in a racially mixed classroom was not as effective a catalyst as sitting right next to white students.

Brown also found that the length of contact opportunity in students' grade school classes provided an additional measure of subsequent positive crossracial relationships although this measure was weak, probably due to the many intervening factors that can occur over time.

Early and Non-High School Predictors of Social Outcomes When in Competition with Other Factors

The data in Tables 2 and 3 show only the significant predictors of various kinds of social relationships for black and white high school students from Patchen's comprehensive analysis.* These summary tables show findings that go far beyond the foregoing analyses and provide an exceptionally useful and systematic set of data. These data indicate that a multitude of variable must be considered when the contact hypothesis is thoroughly tested.

In order to overcome problems of curvilinearity, Patchen constructed dummy variables out of each category of some important variables. For example, he created separate dummy variables for each of the various categories of the proportion of black students in the classes. He also combined variables that he found to significantly interact with each other or with third variables. The result of these and other data management procedures was the ability to bring together in two tables (Table 2 for blacks; Table 3 for whites) the significant predictors of six social outcomes stemming from all the variables considered in the comprehensive study. (Variables that were originally included in the regression equation but did not indicate strength when other factors are controlled are shown in the footnotes of Tables 2 and 3.

As in Table 1, the partial beta coefficients reflect the significant direct effects of the variables when the effects of the other variables have been removed. Note that Patchen has created a typology under which the many variables can be categorized.

*Tables 2 and 3 are excerpts from Patchen (1982), pages 212-214 and 218-219, respectively.

Let us pull out a few observations of interest from Tables 2 and 3.

1. For both black and white students, positive parental racial attitudes are the strongest and most consistent overall predictors of positive social relations among high school students, and to a lesser degree, the suppression of unfriendly contacts.

2. Only one other predictor besides parental attitudes is significantly related to all six social outcomes, and this finding holds only for whites. White students who perceive blacks as having much greater power tend to avoid them; have considerably fewer friendly contacts and fewer friendships; more unfriendly contacts; and less favorable crossracial attitudes and opinions of other race people.

3. As with the data that was presented in Table 1, most of the independent variables contribute to <u>different</u> social outcomes rather than broadly impacting the various dependent variables.

4. Although the impact of the early friendly crossracial contact variables (in grade schools, neighborhoods) did not have particularly strong effects on the various dependent variables, it did still show significant influence in a number of situations and under a number of conditions shown in the tables.

5. Students with higher aggresive tendencies were much more likely to become involved in unfriendly crossracial contacts than those with lower aggressive characteristics. Blacks, but not whites, who were more aggressive apparently made considerable efforts to avoid white students, possibly because of their aversion to them.

6. Participation in school activities with common goals was rather strongly linked to friendly contacts for both black and white students.

7. Opportunities as a measure of possible contact in grade schools or in neighborhoods did not have a significant direct effect on any of the six social outcomes. Opportunity for contact in high school, when coupled with positive racial attitudes among peers (for whites) and under some rather specific and limited conditions, tended to foster more friendly contacts in high school. (Note the specific conditions in the tables.)

8. For blacks, perceptions of favoritism toward whites had a rather strong negative effect on their racial attitudes, and a weak negative effect on friendships with whites and opinions of whites.

Although the data itself is not shown, several other findings from Patchen's analyses are summarized below.

Academic Achievement

None of the variables measuring types of early or non-high school contact with other races (as shown in Table 1) had significant direct effects on either black or white students' academic outcomes. The most

influential factors relating positively to students' achievement scores were the students' I.Q.; being in academic programs; being in higher ability groupings; and being male (despite the advantages indicated for females on their effort and grades). Thus the academic benefit to blacks from interracial contacts is not necessarily an outcome from having social contacts.

Importance of Equal-Status Contact Questioned

Patchen (1982:175-186), through a series of analyses of different objective and subjective measures, did not find much support for the somewhat taken-for-granted proposition that equality of either SES or academic status were important conditions for favorable crossracial relationships. Riordan (1975) and Amir (1976) have also questioned this major component of Allport's original premise regarding contact theory.

Racial Composition of Classes

Some of the general tendencies from Patchen's in depth analysis of the effects of class social composition on social relations and academic outcomes are noted. When there was a small percent of blacks (less than 10%), social relations were generally favorable and academic achievements were relatively high for both blacks and whites. When the percent of blacks rose from 10-4-%, there was more friction between the races, but academic outcomes remained relatively high for both blacks and whites. However, when the proportions of blacks and whites were about even, both social relations and academic outcomes tended to be poor. When there was a clear black majority (60%+), social relations were generally at their best, but academic outcomes were low.

IMPLICATIONS OF MEASURES OF CONTACTS

Patchen (1982:329-352) provides a summary of the major findings from the Indianapolis high school study and also the implications of these findings. We will limit this "implications" section to the selection of measures to further test the contact hypothesis.

1. Opportunity for crossracial contact, as measured by school racial composition, can be misleading. Within school of all racial compositions, there are class situations and other incidents of positive interracial contacts; these cannot be analyzed when the gross racial composition of the entire school is the measure used to study the effects of the contact hypothesis.

2. Classroom racial composition is a step forward as a measure of potential crossracial contact. In addition, measures of physical proximity in students' classes, labs, or other school groups can provide a useful predictive measure to study the effectiveness of some contact outcomes.

3. The sheer amount of actual contact is useful, not only as a measure of contact, but as a means of understanding the resistance to changes in racial attitudes and changes when efforts are made to improve race relations. Brown's analysis suggested that those students wh had experienced a greater number of crossracial contacts (and also had experineced them at younger ages) were less likely to alter their

attitudes toward other race students when they had either positive or negative social experiences in high school. In a word, considerable contact, especially if it occurs early, tends to "fix" crossracial attitudes relative to the more pliable racial attitudes of those students with minimal crossracial experiences.

4. In addition, the nature of the racial experiences is crucial to testing the effects of crossracial contact. As previously noted, Brown found this component of contact to determine the direction (positive or negative) of subsequent racial attitudes whereas the amount of contact was the best indicator of the strength of the subsequent attitude.

5. The best overall measure of contact is the combination of amount-times-nature of contact.

6. Age of initial contact is a particularly useful measure and should be included in race relations studies.

7. Supplementary measures of contact are also useful, but can be misleading if used alone. For instance, observing the extent of racial segregation in school dining rooms may be more indicative of social peer pressures to sit with one's own race than it is of the extent that there is some amount of interracial contact in the school.

8. Most important is the strategy to collect as much school information as funding and time permits when studying race relations. Patchen's work provides insight into many of the vriables which should be considered in planning a study. Certainly many factors impinge on various outcomes of crossracial contact, and these independent variables can have more specific outcomes than generally has been recognized. Certainly parental attitudes toward other race people should be included in studies that test the contact hypotheses. To sum up this last point, relevant variables should be included that can intervene in the processes between crossracial contacts and the potential social outcomes from these contacts.

Future Research Directions

Patchen and his colleagues employed some path models to guide their reseach and analyses. (See Figures 5.7 and 5.8, pages 102 and 106.) Without these conceptual models, their tasks would have been far more difficult to carry out. The path models they used were not overly complex. Nonetheless, they were essential tools for carrying out their research project.

This leads us to the one additional suggestion for future research. There is a need for greater effort in model building. If we are to see the "big picture," that is, an integration of the processes constantly going on, and the way these processes have cumulative effects over time we must develop better and more comprehensive models to guide our efforts. The models need to show the interrelationships as logical, ongoing, cybernetic processes.

As our abilities to formulate realistic models improve, we will have far greater insight into what stage of the overall process lends itself to cost-effective intervention, and what we can do to facilitate the intervention and keep other influences from negating the purpose of the intervention.

Path diagrams such as those used in the Indianapolis study and in other studies, are a good beginning. At this point of sophistication, developing mathematical models are of less importance than developing realistic conceptual models.

If we are to make significant advances in sociology and social psychology, improved model building likely will play a crucial role.

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